Fractions with Unlike Denominators
Adding and Subtracting

We can use fraction bars to add fractions with unlike denominators. We put the fractions into the same denominator and then add.

To add fractions with different denominators, we find the LCD, least common denominator. Once we find the LCD, we express each fraction into the same denominator and then all that's left is to add the numerators.

We will also take a look at subtracting fractions using fraction bars.

To subtract fractions with different denominators, we find the LCD, least common denominator. We then express each fraction into the same denominator and all that's left is to subtract the numerators.

Estimating fractions helps to determine an approximate answer. We can use it as a quick check just to make sure our answer is reasonable. We will look at rounding to the nearest half and apply it to solving a word problem where the answer required is just an estimate.

Write fraction answers using the form in these examples.
Example 1: two-thirds is written as 2/3.
Example 2: five and three fourths is written as 5 3/4.

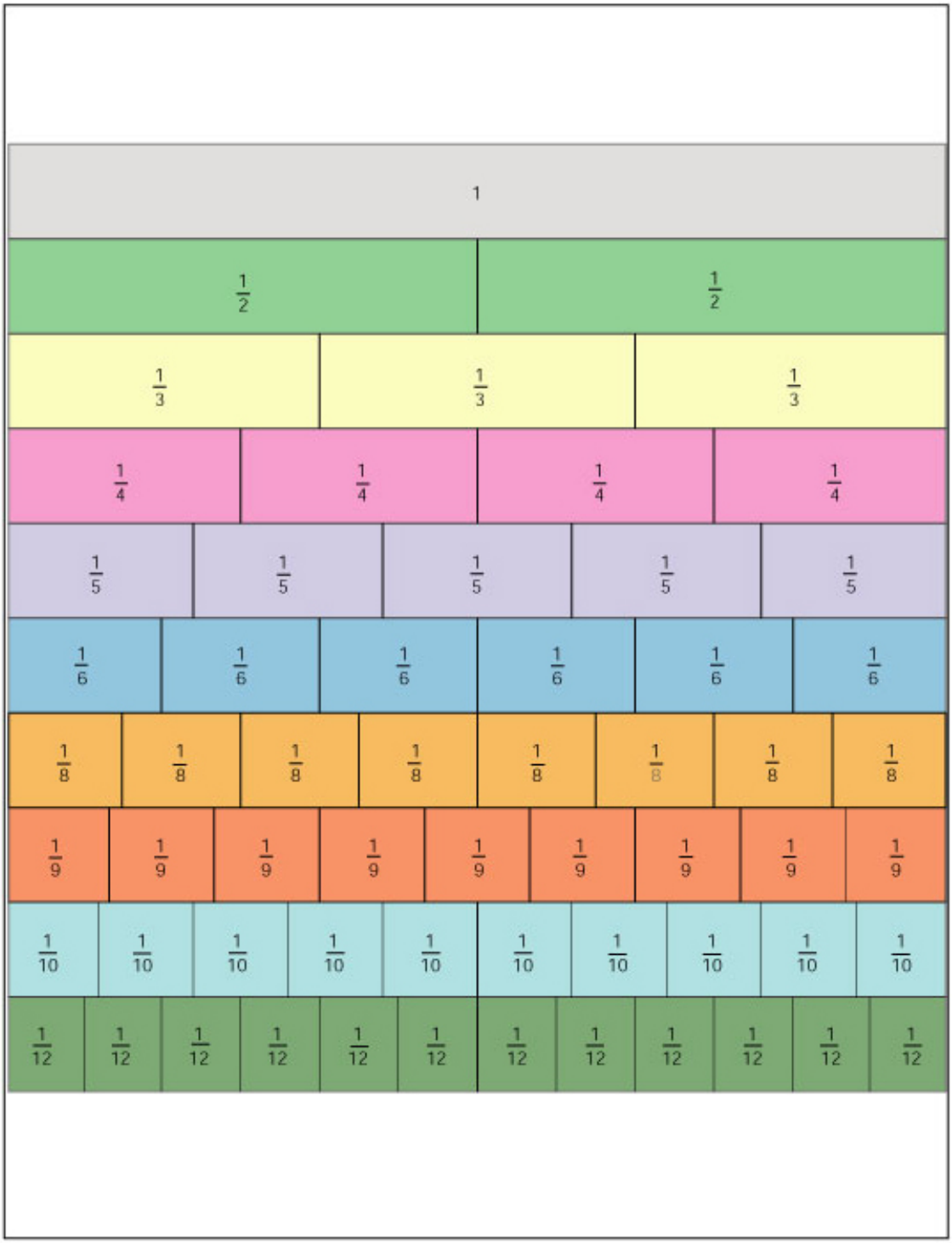
Fraction Bars
Adding Fractions with Unlike Denominators Using Fraction Bars
Adding Fractions with Unlike Denominators
Subtracting Fractions Using Fraction Bars
Subtracting Fractions
Rounding and Estimating with Fractions

Fraction Bars

Look over these fraction strips. Each strip represents 1 whole.

1 = 2 halves, 3 thirds, 4 fourths, 5 fifths, 6 sixths, and so on.

Thus, 1 = 2/2 = 3/3 = 4/4 = 5/5 = 6/6 and so on…

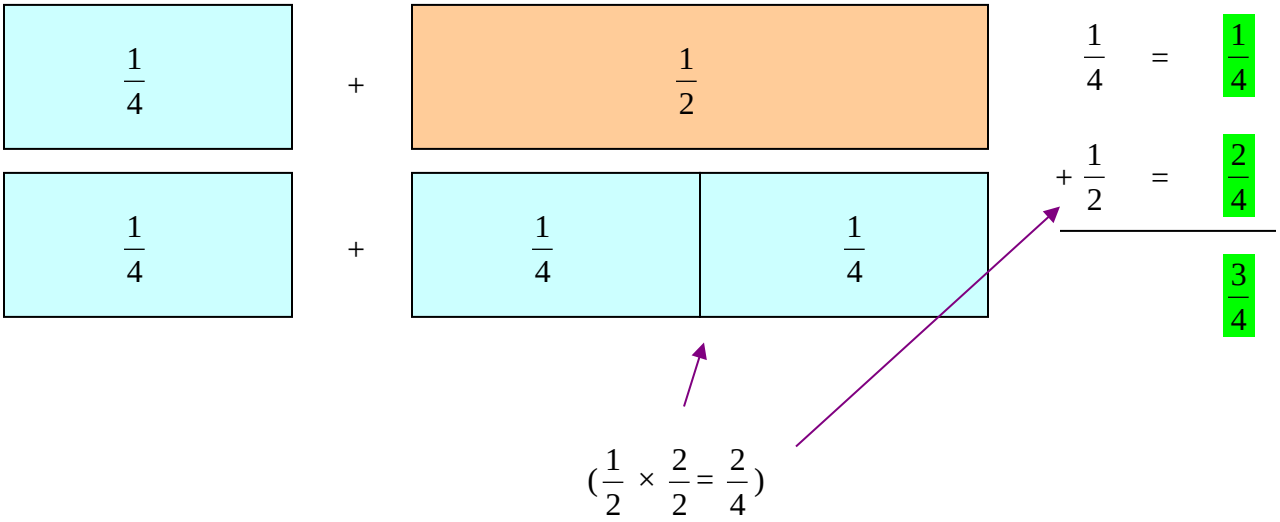


Adding Fractions with Unlike Denominators Using Fraction Bars

Study the two addition problems below. To add fractions with unlike denominators, express the fractions into equivalent fractions with the same denominator.

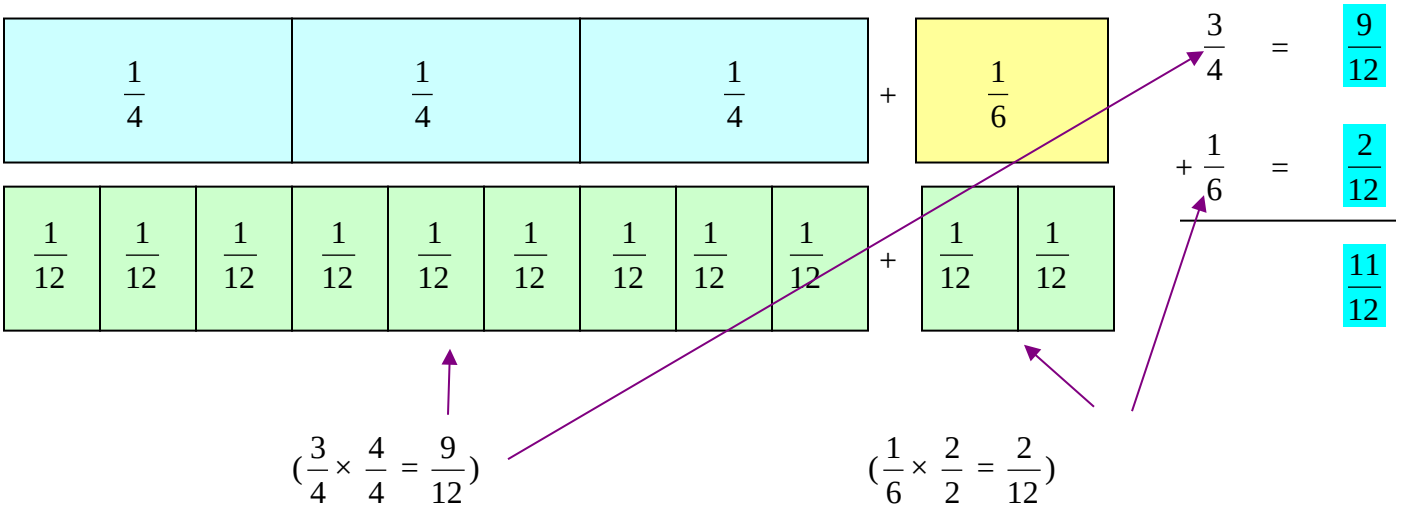
Example 1:

Add $\frac{1}{4} + \frac{1}{2}$



Example 2:

Add $\frac{3}{4} + \frac{1}{6}$



Adding Fractions with Unlike Denominators

Find $\frac{7}{8}+\frac{3}{4}$

Find LCD for 4 & 8.

List multiples of 8
8 = {**8**, 16, 24...}
List multiples of 4
4 = {4, **8**, 12...}

LCD is the first common multiple in both sets.
LCD = **8**

$$\frac{7}{8}=\frac{7}{8}$$
$$+\ \frac{3}{4}=\frac{6}{8}$$
$$\frac{13}{8}=\mathbf{1}\frac{5}{8}$$

$\frac{3}{4}\times\frac{2}{2}=\frac{6}{8}$ or say 4 divides into 8, 2 times, 3 x 2 = 6.

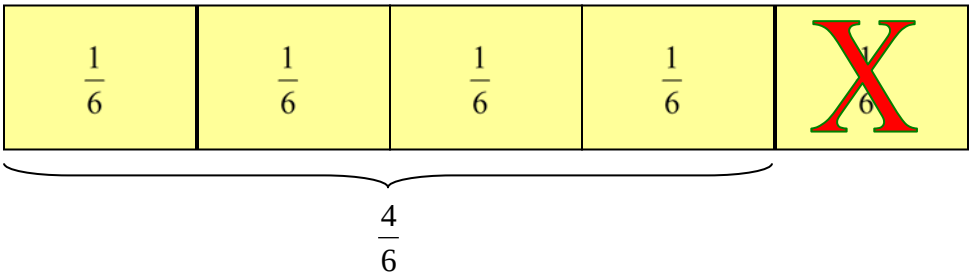
$\frac{13}{8}=\frac{8}{8}+\frac{5}{8}=\mathbf{1}+\frac{5}{8}=\mathbf{1}\frac{5}{8}$

or $8\overline{)13}$ $\begin{array}{r}1\\ \underline{8}\\ 5\end{array}$ $=1\frac{5}{8}$

Subtracting Fractions Using Fraction Bars

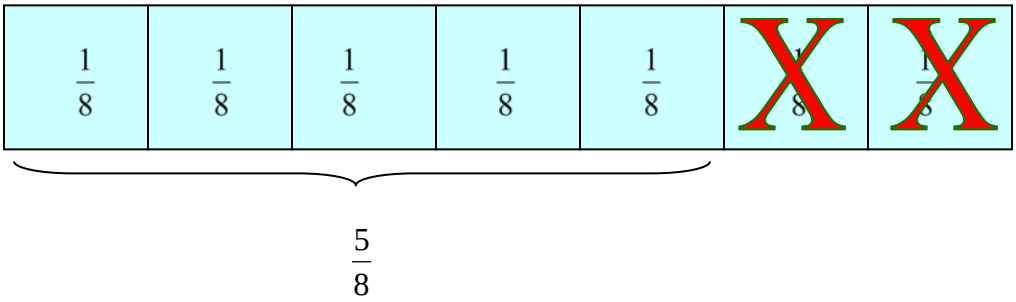
Subtract $\frac{5}{6} - \frac{1}{6}$

$$\begin{array}{r} \frac{5}{6} \\ -\ \frac{1}{6} \\ \hline \frac{4}{6} = \frac{2}{3} \end{array}$$



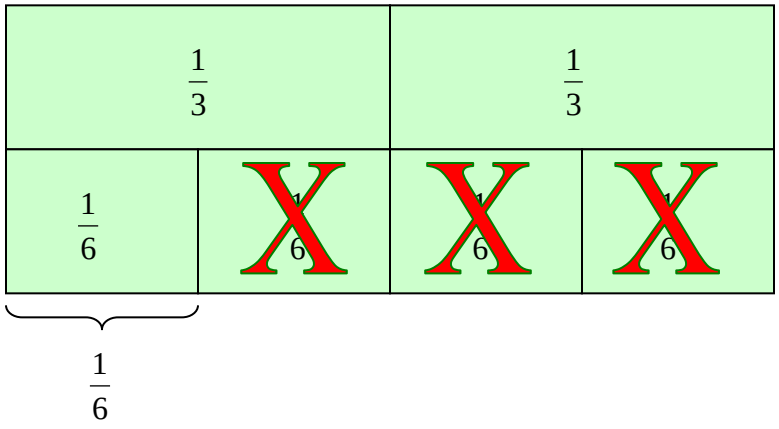
Subtract $\frac{7}{8} - \frac{1}{4}$

$$\begin{array}{rcl} \frac{7}{8} & = & \frac{7}{8} \\ -\ \frac{1}{4} & = & \frac{2}{8} \\ \hline & & \frac{5}{8} \end{array}$$



Subtract $\frac{2}{3} - \frac{1}{2}$

$$\begin{array}{rcl} \frac{2}{3} & = & \frac{4}{6} \\ -\ \frac{1}{2} & = & \frac{3}{6} \\ \hline & & \frac{1}{6} \end{array}$$



Subtracting Fractions

Example 1: Find 11/12 – 5/12. Simplify, if necessary.

$$\begin{array}{r} \frac{11}{12} \\ -\frac{5}{12} \\ \hline \frac{6}{12} = \frac{1}{2} \end{array}$$

$\frac{6}{12} \div \frac{6}{6} = \frac{1}{2}$

Thus, 11/12 – 5/12 = 1/2.

Example 2: Find 7/8 – 5/6. Simplify, if necessary.

Find the LCD of 8 & 6.

List multiples of 8
8 = {8, 16, **24**, 32 ...}
List multiples of 6
6 = {6, 12, 18, **24**, 30 ...}

The **LCD** is the first common factor in both sets.

LCD = 24

$$\begin{array}{r} \frac{7}{8} = \frac{21}{24} \\ -\frac{5}{6} = \frac{20}{24} \\ \hline \frac{1}{24} \end{array}$$

$\frac{7}{8} \times \frac{3}{3} = \frac{21}{24}$ or say 8 divides into 24, 3 times, $7 \times 3 = 21$.

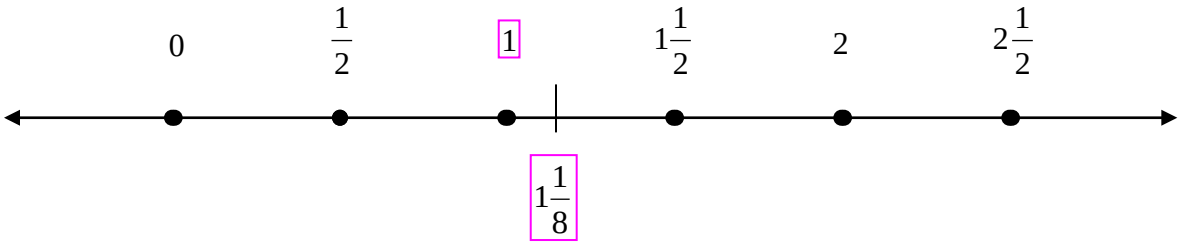
$\frac{5}{6} \times \frac{4}{4} = \frac{20}{24}$ or say 6 divides into 24,4 times, $5 \times 4 = 20$.

Rounding and Estimating with Fractions

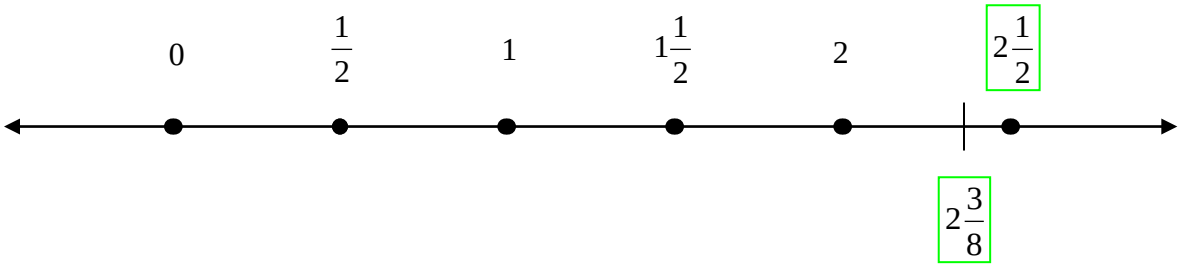
Rounding

Round each fraction to the nearest half.

$1\frac{1}{8}$ rounds to 1 because it is nearest to 1 on the number line divided into half units.



$2\frac{3}{8}$ rounds to $2\frac{1}{2}$ because it is nearest to $2\frac{1}{2}$ on the number line.



Estimating

Use estimation to solve this word problem.

Donnie's dad is planning to fence in a rectangular area of the yard for his new puppy. The area will be 40 2/3 foot long and 30 1/3 foot wide. To the nearest half foot, approximately how much fencing must be purchased?

Since 2/3 is more than 1/2, round 40 2/3 to 41.

Since 1/3 is less than 1/2, round to 30 1/3 to 30.

Approximately **142 feet** of fence is needed. (41 + 41 + 30 + 30)